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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

**James Clifton Potter**

Serial No.: 10/064,659

Filed: August 5, 2002

For: APPARATUS AND METHOD FOR DETERMINING HYBRID ELECTRIC  
VEHICLE PERFORMANCE

Attorney Docket No.: 220-1165 / 81046591 / FMC 1699 PUS

Group Art Unit: 3618

Examiner: Jeffrey J. Restifo

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
U.S. Patent & Trademark Office  
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Sir:

This is an Appeal Brief from the final rejection of claims 1-20 of the Office  
Action mailed on September 17, 2004 for the above-identified patent application.

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**I. REAL PARTY IN INTEREST**

The real party in interest is Ford Motor Company ("Assignee"), a corporation organized and existing under the laws of the state of Delaware, and having a place of business at The American Road, Dearborn, Michigan 48121, as set forth in the assignment recorded in the U.S. Patent and Trademark Office on August 5, 2002 at Reel 012951/Frame 0262.

**CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8**

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*Marc F. Malooley*  
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## **II. RELATED APPEALS AND INTERFERENCES**

There are no appeals or interferences known to the Appellant, the Appellant's legal representative, or the Assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

## **III. STATUS OF CLAIMS**

Claims 1-20 are pending in this application. Claims 1-20 have been rejected and are the subject of this appeal.

## **IV. STATUS OF AMENDMENTS**

No amendment after final rejection has been filed.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

Claim 1 recites an apparatus which includes a controller 16 which calculates a maximum sustainable speed of a hybrid electric vehicle. A schematic illustration of such a hybrid electric vehicle 10 is shown in Figure 1. As described in the specification, for example, in paragraph 0041, the maximum sustainable speed refers to the speed of a vehicle, such as the hybrid electric vehicle 10, and may have conventional speed units, such as miles per hour. Moreover, paragraph 0041 of the specification describes the maximum sustainable speed as defining a steady operating speed of a vehicle "which may be accomplished over some predetermined period of time...or which may allow the vehicle [ ] to perform some predetermined maneuver."

The apparatus recited in claim 1 also includes a display 14 which, in the embodiment as shown in Figure 1, includes an alphanumeric display portion 22. The display 14 is coupled to the controller 16, and functions to display the maximum sustainable speed calculated by the controller 16. As described in paragraph 0041 of the specification, the

display portion 14 allows a driver to view a current operating speed of the vehicle, as well as the maximum sustainable speed of the vehicle.

Claim 9 recites a vehicle which includes an apparatus for continually determining, and then displaying, a maximum sustainable speed of the vehicle. As noted above, Figure 1 illustrates a schematic representation of a hybrid electric vehicle 10. Further, the apparatus for determining and displaying the maximum sustainable speed of the vehicle was also described above. Claim 9 recites that the apparatus is for "continually" determining and displaying the maximum sustainable speed. As described, for example, in paragraphs 0017, 0049 and 0050 of the specification, continual updates of the maximum sustainable speed may occur as the vehicle 10 is being operated.

Claim 14 recites a method for operating a vehicle, steps of which are illustrated in Figure 2. The method includes the step of determining a maximum sustainable speed, which is illustrated at step 102 in Figure 2. The method recited in claim 14 also includes using the maximum sustainable speed to make a determination regarding whether the vehicle should perform a certain maneuver. The information required for such a determination is illustrated at step 118, where the maximum sustainable speed is displayed. The use of the maximum sustainable speed information is described in the specification, for example, in paragraph 0050, where it is noted that a vehicle operator may use a value of the maximum sustainable speed to determine whether to begin a maneuver.

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

- A. Claims 9-16 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,366,848 (Gustavsson).
- B. Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gustavsson in view of U.S. Patent No. 6,540,035 (Nagano et al.).

C. Claims 4-8 and 17-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gustavsson as modified by Nagano et al. as applied to claims 1 and 14, and further in view of U.S. Patent No. 5,992,553 (Morrison).

## VII. ARGUMENT

A. Claims 9-16 Are Patentable Under 35 U.S.C. § 102(e) over Gustavsson.

1. Claim 9

Claim 9 recites "[a] vehicle including an apparatus for continually determining and displaying a maximum sustainable speed of said vehicle." No such apparatus is described in Gustavsson. Moreover, each and every element of claim 9 is neither expressly nor inherently described in Gustavsson; therefore, the MPEP definition of anticipation (MPEP § 2131, 8<sup>th</sup> ed., Rev. 2) is not met.

Gustavsson does describe an engine control system that provides incentives to drivers, and in particular a system which rewards a driver who has met a predetermined performance goal. (Col. 1, ll. 63-65.) The control system of Gustavsson establishes an operating speed limit, and then limits the operating speed of the vehicle to the established speed limit. A maximum vehicle speed and an incentive speed limit are established, and if the operator meets a performance goal, the operating speed limit is increased to the incentive speed limit. (Col. 2, ll. 1-8.) As shown in Figure 1, the system of Gustavsson includes a speed governor 15 that limits the maximum speed of the vehicle—see also column 3, lines 27-32. Thus, the control system of Gustavsson establishes a maximum vehicle speed, controls systems within the vehicle so that the vehicle cannot be operated above this speed, and then conveys this information to the driver. As specifically stated in Gustavsson, "the present invention integrates into an existing vehicle display and keeps the driver informed as to the maximum attainable speed of his vehicle at any time." (Col. 1, ll. 55-57.)

The control system described in Gustavsson is markedly different than the present invention as recited in claim 9. For example, claim 9 describes an apparatus for determining a "maximum sustainable speed." No such element is expressly or inherently described in Gustavsson. Gustavsson discusses displaying a maximum *attainable* speed, but this not the same as a maximum sustainable speed. The maximum attainable speed as described in Gustavsson is a speed limit, that is mechanically and/or electrically controlled by a control system, so that regardless of vehicle operating conditions, the driver cannot exceed this speed.

In contrast, the maximum sustainable speed recited in claim 9 defines a steady operating speed of the vehicle, which, for example, "may be accomplished over some predetermined period of time (e.g., about five minutes) or which may allow the vehicle [ ] to perform some predetermined maneuver." (Specification, paragraph 0041.) Such maneuver may include, for example, "a calculated pass, or substantially any other maneuver which requires an increased amount of power or speed from the [vehicle]." (Specification, paragraph 0045.) Whereas a vehicle may exceed a maximum *sustainable* speed for some short period of time, a vehicle cannot exceed the maximum *attainable* speed for any amount of time.

Claim 9 is further distinguished from Gustavsson, since it recites that the maximum sustainable speed is *determined*. This is in contrast to the system described in Gustavsson, which is a control system which *establishes* a vehicle operating speed limit, and then limits operation of the vehicle so the established speed is not exceeded. Thus, claim 9 contains elements which are neither expressly nor inherently described in Gustavsson. Moreover, Gustavsson does not show the identical invention in as complete detail as is contained in claim 9. Therefore, with regard to claim 9, the MPEP definition of anticipation is not met.

2. Claim 11

Claim 9 is the base claim for claim 11. In addition, claim 11 recites that the vehicle further includes "a pulse wheel which is coupled to said controller, which measures an acceleration of said vehicle, and which communicates said measured acceleration to said controller. No such element is either expressly or inherently described in Gustavsson. The Examiner states that Gustavsson discloses "a pulse wheel sensor 43 for measuring velocity and acceleration...." In fact, Gustavsson states that element 43 is a "vehicle speed signal" that "is input to the microprocessor 20 as well as a signal representing an engine fuel rate 45." (Col. 2, ll. 58-60.) Thus, not only is element 43 not a pulse wheel sensor, it is not a sensor of any kind. Therefore, claim 11 also includes elements which are neither expressly nor inherently described in Gustavsson, and claim 11 is not anticipated by that reference.

3. Claim 13

Claim 13 recites a controller that "calculates a second maximum sustainable speed and causes said second maximum sustainable speed to be displayed only if said second maximum sustainable speed differs from said sustainable speed by a predetermined amount." As discussed above, Gustavsson does not describe, either expressly or inherently, any maximum sustainable speed; therefore, Gustavsson does not describe a second maximum sustainable speed. In addition, the control system of Gustavsson will change the vehicle operating speed limit to the incentive speed limit only when the vehicle operator has met a performance goal. (Col. 1, ll. 62-Col. 2, ll. 1-8.) Gustavsson does not expressly or inherently describe the elements of claim 13, and Gustavsson does not show the identical invention in as complete detail as contained in claim 13. Therefore, Gustavsson does not anticipate claim 13.

4. Claim 14

Claim 14 recites "[a] method for operating a vehicle comprising the steps of: determining a maximum sustainable speed; and using said maximum sustainable speed to determine whether to cause said vehicle to perform a certain maneuver." As discussed above with reference to claim 1, Gustavsson does not expressly or inherently describe determining a maximum sustainable speed. Therefore, Gustavsson also does not describe, either expressly or inherently, using a maximum sustainable speed for any determination, and in particular for a determination of whether to cause a vehicle to perform a certain maneuver, as specifically recited in claim 14. Therefore, Gustavsson does not anticipate claim 14 in accordance with MPEP requirements.

5. Claim 15

Claim 15, which depends from claim 14, further recites that the maximum sustainable speed will only be calculated if the speed of the vehicle is greater than zero. Gustavsson does not expressly or inherently describe determining a maximum sustainable speed, and therefore, it also does not describe the additional limitation of calculating such maximum sustainable speed only if the speed of the vehicle is greater than zero. Therefore, Gustavsson does not anticipate claim 15.

6. Claim 16

Claim 16 depends from claim 15, and further includes the step of "displaying a predetermined value when said vehicle speed is zero." No such element is either expressly or inherently described in Gustavsson; therefore, that reference does not anticipate claim 16.

7. Claims 10 and 12

Claims 10 and 12 are dependent claims, and are also believed to be patentable.

B. Claims 1-3 are patentable under 35 U.S.C. § 103(a) over Gustavsson in view of Nagano et al.

1. Claim 1

Claim 1 recites "a controller which calculates a maximum sustainable speed of a hybrid electric vehicle; and a display which is coupled to said controller and which displays said calculated maximum sustainable speed." None of the cited references teach, or even suggest, the calculation of a maximum sustainable speed of any type of vehicle. As discussed above with regard to the anticipation rejections, Gustavsson does not expressly or inherently describe any type of apparatus, including a controller, for calculating a maximum sustainable speed of a vehicle. Moreover, Gustavsson does not even suggest such an apparatus. There is no mention anywhere in Gustavsson of calculating a maximum sustainable speed. The same is true for Nagano et al. In order to establish *prima facie* obviousness, the MPEP requires that all of the claim limitations of an invention be taught or suggested by the prior art. MPEP § 2143.03, 8<sup>th</sup> ed., Rev. 2. Therefore, with regard to the combination of Gustavsson and Nagano et al., as applied to claim 1, the MPEP requirements for *prima facie* obviousness are not met.

In addition to failing to teach or suggest all of the claim limitations of claim 1, there is nothing to suggest that combining Gustavsson and Nagano et al. is desirable. The MPEP states that merely because references can be combined or modified does not render the combination obvious unless the prior art suggests the desirability of the combination. MPEP § 2143.01, 8<sup>th</sup> ed., Rev. 2. Gustavsson discusses the use of a speed governor as part of a control system to provide an incentive to drivers. Nagano et al. discusses various aspects of a hybrid electric vehicle. There is nothing to suggest the desirability of the combination, particularly in light of the subject matter of the claimed invention, which is not directed toward providing incentives for drivers, but



rather, is directed toward, for example, providing information to drivers about a maximum sustainable speed.

2. Claim 2

Claim 2 further defines the apparatus of claim 1, reciting that the "controller continually calculates said maximum sustainable speed as said hybrid electric vehicle is being operated and wherein said displayed maximum sustainable speed is continually updated as said hybrid electric vehicle is being operated." As noted above, neither Gustavsson nor Nagano et al. teach or suggest the calculation of a maximum sustainable speed. Therefore, it is axiomatic that neither teaches or suggests continually calculating a maximum sustainable speed and continually updating a display of the maximum sustainable speed, as recited in claim 2. Therefore, the combination of Gustavsson and Nagano et al. does not render obvious claim 2.

3. Claim 3

Claim 3 depends from claim 1, and further recites that the "controller calculates a second maximum sustainable speed of said hybrid electric vehicle and causes said second maximum sustainable speed to be displayed only if said second maximum sustainable speed differs from said previously calculated maximum sustainable speed by a predetermined amount." As noted above, the combination of Gustavsson and Nagano et al. does not teach or suggest the calculation of a first maximum sustainable speed, much less a second maximum sustainable speed. Moreover, there is no teaching or suggestion in the combination of references that such second maximum sustainable speed only be displayed if it differs from the previously calculated maximum sustainable speed by a predetermined amount. Therefore, the combination of Gustavsson and Nagano et al. does not render obvious claim 3.

C. Claims 4-8 and 17-20 are patentable under 35 U.S.C. § 103(a) over Gustavsson as modified by Nagano et al., and further in view of Morrison.

1. Claims 4-8

Claim 1 is the base claim for claims 4-8. Therefore, each of these dependent claims contains all of the limitations of claim 1, as well as additional limitations which further distinguish it from the cited references. The addition of the Morrison reference to Gustavsson and Nagano et al. does not render obvious any of claims 4-8, since the combination fails to teach or suggest all of the limitations of any of these dependent claims. In addition, the MPEP is very clear that there must be some teaching, suggestion or motivation to combine or modify the teachings of the prior art in order to establish obviousness. MPEP § 2143.01, 8<sup>th</sup> ed., Rev. 2. The Morrison reference describes a power augmentation system for a bicycle that is designed to augment a rider's power input when it is required. (Col. 3, ll. 22-32.) There is no suggestion or motivation to combine such a reference with Gustavsson and Nagano et al. In light of the foregoing, each of claims 4-8 are believed to be patentable.

2. Claim 17

Claim 17, which has claim 14 as its base claim, recites measuring a torque and estimating a grade force, and using these values to calculate a maximum sustainable speed, only if a measured acceleration is greater than zero. As noted above, neither Gustavsson nor Nagano et al. teach or suggest the calculation of a maximum sustainable speed. The addition of Morrison, which describes a power augmentation device for a bicycle, also does not teach or suggest such limitations. Therefore, the combination of references does not teach or suggest using the elements of torque and grade to calculate a maximum sustainable speed, and only then if a measured acceleration is greater than zero, as specifically recited in claim 17. Therefore, the cited combination of references does not render obvious claim 17.

3. Claims 18-20

Claim 14 is the base claim for claims 18-20. Each of these dependent claims contains all of the limitations of claim 14, as well as additional limitations which further distinguish it from the cited references. As such, each of claims 18-20 is believed to be patentable.

Please charge the fee of \$500.00 as applicable under the provisions of 37 C.F.R. § 41.20(b)(2), as well as any additional fees, or credit any overpayment in connection with this filing, to Ford Global Technologies LLC, Deposit Account No. 06-1510. A duplicate of this page is enclosed for this purpose.

Respectfully submitted,

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Enclosure - Appendices



### VIII. CLAIMS APPENDIX

1. An apparatus comprising: a controller which calculates a maximum sustainable speed of a hybrid electric vehicle; and a display which is coupled to said controller and which displays said calculated maximum sustainable speed.

2. The apparatus of Claim 1 wherein said controller continually calculates said maximum sustainable speed as said hybrid electric vehicle is being operated and wherein said displayed maximum sustainable speed is continually updated as said hybrid electric vehicle is being operated.

3. The apparatus of Claim 1 wherein said controller calculates a second maximum sustainable speed of said hybrid electric vehicle and causes said second maximum sustainable speed to be displayed only if said second maximum sustainable speed differs from said previously calculated maximum sustainable speed by a predetermined amount.

4. The apparatus of Claim 1 wherein said controller calculates said maximum sustainable speed by the use of an amount of rolling resistance between at least one tire of said hybrid electric vehicle and a surface, an amount of aerodynamic drag which is applied to said hybrid electric vehicle, an amount of inclination force which is applied to said hybrid electric vehicle, and an amount inertial force which is applied to said hybrid electric vehicle.

5. The apparatus of Claim 4 wherein said amount of rolling resistance between said at least one tire of said hybrid electric vehicle and said surface is calculated by use of the weight of said vehicle.

6. The apparatus of Claim 5 wherein said hybrid electric vehicle is operated at a speed and wherein said amount of aerodynamic drag is calculated by the use of said speed of said hybrid electric vehicle.

7. The apparatus of Claim 6 wherein said hybrid electric vehicle accelerates by a certain amount and wherein said certain amount of inertial force is calculated by the use of said certain amount of acceleration of said hybrid electric vehicle.

8. The apparatus of Claim 7 further comprising a pulse wheel which is coupled to said controller and which measures said certain amount of acceleration.

9. A vehicle including an apparatus for continually determining and displaying a maximum sustainable speed of said vehicle.

10. The vehicle of Claim 9, wherein said apparatus includes a controller which receives certain signals and which uses said certain signals to calculate said maximum

sustainable speed of said vehicle and a display portion which is coupled to said controller and which displays said determined certain maximum sustainable speed.

11. The vehicle of Claim 10 further comprising a pulse wheel which is coupled to said controller, which measures an acceleration of said vehicle, and which communicates said measured acceleration to said controller.

12. The vehicle of Claim 10 wherein said vehicle is operated at a certain speed and wherein said display portion displays said certain speed.

13. The vehicle of Claim 12 wherein said controller calculates a second maximum sustainable speed and causes said second maximum sustainable speed to be displayed only if said second maximum sustainable speed differs from said sustainable speed by a predetermined amount.

14. A method for operating a vehicle comprising the steps of: determining a maximum sustainable speed; and using said maximum sustainable speed to determine whether to cause said vehicle to perform a certain maneuver.

15. The method of Claim 14 further comprising the steps determining whether the speed of said vehicle is greater than zero; and calculating said maximum sustainable speed only if said speed of said vehicle is greater than zero.

16. The method of Claim 15 further comprising the step of displaying a predetermined value when said vehicle speed is zero.

17. The method of Claim 15 wherein said step of calculating said maximum sustainable speed comprises the steps of: measuring an acceleration of a hybrid electric vehicle; measuring a torque of at least one axle of said hybrid electric vehicle; estimating a grade force; and using said torque and said estimated grade to calculate said maximum sustainable speed only if said measured acceleration is greater than zero.

18. The method of Claim 17 further comprising the step of determining whether the calculated maximum sustainable speed varies from a previously calculated maximum sustainable speed by a predetermined amount.

19. The method of Claim 18 further comprising the step of displaying said calculated maximum sustainable speed only if said calculated maximum sustainable speed varies from said previously displayed maximum sustainable speed by a predetermined amount.

20. The method of Claim 19 wherein said predetermined amount is greater than ten percent of said previously displayed maximum sustainable speed and wherein said method further comprises the step of displaying the current speed of the vehicle.



**IX. EVIDENCE APPENDIX**

None

**X. RELATED PROCEEDINGS APPENDIX**

None